

# **DO IT YOURSELF (DIY) MODULAR CABINET**

## **BACKGROUND OF THE INVENTION**

### **1. Field of the Invention**

The present invention relates to a cabinet, and more particularly to a do it yourself (DIY) modular cabinet that can be conveniently assembled or disassembled without using any tools.

### **2. Description of Related Art**

Do it yourself (DIY) modular furniture is currently popular because DIY furniture can be transported easily after being disassembled into component pieces and also can be changed into different forms depending on different requirements. Additionally, people enjoy a sense of achievement when the furniture is completed.

However, DIY modular furniture still has some disadvantages because tools are needed when the furniture is assembled or disassembled. For example, a conventional DIY cabinet is composed of multiple boards or sheets of materials to fabricate a frame in which objects are held. Fastening devices detachably used to connect adjacent boards or sheets of materials to construct a frame are mostly flat-head or oval-head countersunk screws that require a suitable screwdriver to fasten or release the countersunk screws. Therefore, assembling or disassembling the DIY cabinet is inconvenient or impossible when suitable tools are not available.

The present invention has arisen to mitigate or obviate the disadvantages of the conventional DIY cabinet.

## **SUMMARY OF THE INVENTION**

1           The main objective of the present invention is to provide a do it  
2 yourself (DIY) modular cabinet that can be conveniently assembled and  
3 disassembled without using any tools.

4           A DIY cabinet in accordance with the present invention has a  
5 foldable frame, a top panel, a bottom panel, a rear panel, multiple pop-it  
6 fasteners, optionally at least one door assembly and an optional shelf. The  
7 panels are attached to the frame with the pop-it fasteners. Each pop-it  
8 fastener is composed of a countersunk tube and a stud. The countersunk  
9 tubes are pressed into head holes in the top and bottom panels, and the studs  
10 are screwed into and extend from base holes in the panels corresponding to  
11 the head holes containing the countersunk tubes. The studs extending from  
12 the base holes are pressed respectively into the countersunk tubes. Thereby,  
13 the panels are conveniently mounted on the frame without using any tools.  
14 Moreover, the foldable frame reduces the size of the disassembled cabinet.

15          Further benefits and advantages of the present invention will become  
16 apparent after a careful reading of the detailed description with appropriate  
17 reference to the accompanying drawings.

#### 18 **BRIEF DESCRIPTION OF THE DRAWINGS**

19          Fig. 1 is an exploded perspective view of a DIY modular cabinet in  
20 accordance with the present invention;

21          Fig. 2 is a perspective view of the DIY modular cabinet in Fig. 1;

22          Fig. 3 is an enlarged side plan view in partial section of a pop-it  
23 fastener in the DIY modular cabinet in Fig. 1;

24          Fig. 4 is an enlarged exploded perspective view in partial of a

1 countersunk flush mounted hinge in the DIY modular cabinet in Fig. 1; and

2 Fig. 5 is an enlarged side plan view in partial section of a locking  
3 device in the DIY modular cabinet in Fig. 1.

#### 4 **DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT**

5 With reference to Figs 1, 2 and 3, a do it yourself (DIY) modular  
6 cabinet in accordance with the present invention comprises a foldable frame  
7 (10), a rear panel (12), a top panel (20), a bottom panel (22), multiple pop-it  
8 fasteners (30), multiple hinges (not numbered), optional at least one door set  
9 (not numbered) and an optional shelf (60). The panels (12, 20, 22) are  
10 attached to the foldable frame (10) with the multiple pop-it fasteners (30).

11 The foldable frame (10) is a right parallelepiped with a top (not  
12 numbered), a bottom (not numbered), two sides (not numbered), a back (not  
13 numbered) and a front (not numbered) and is composed of a front frame  
14 (101), a rear frame (102) and two foldable side panels (11).

15 The front frame (101) and rear frame (102) respectively have an  
16 inside surface (not numbered), an outside surface (not numbered), a top (not  
17 numbered), a bottom (not numbered), a left side (not numbered), a right side  
18 (not numbered), multiple base holes (not numbered) and optional multiple  
19 mortises (not shown). The top, bottom, left side and right side of the front  
20 and rear frames (101, 102) have outside edges (not numbered). The left side  
21 and right side optionally have mortises (not shown) formed in inside surfaces.

22 With further reference to Fig. 4, the two foldable side panels (11) are  
23 pivotally attached respectively between the right and left sides of the front  
24 frame (101) and the rear frame (102) and respectively comprise a front board

1 (not numbered) and a rear board (not numbered) and multiple hinges (40).  
2 The front and rear boards in each foldable side panel (11) have inner edges  
3 (not numbered), outer edges (not numbered), top edges (not numbered),  
4 bottom edges (not numbered), multiple base holes (not numbered) and  
5 multiple optional mortises (412). The base holes are formed in the top and  
6 bottom edges of the front and the rear boards and may be threaded. The  
7 mortises (412) are formed in the inner and outer edges of the front and rear  
8 boards. The inner edges are pivotally attached to each other so the foldable  
9 side panels (11) fold inward. Furthermore, the foldable side panels (11) are  
10 pivotally attached respectively to the right and left sides of the front frame  
11 (101) and the rear frame (102) at the outer edges of the front and the rear  
12 boards by multiple hinges (40). The hinges (40) may be countersunk flush  
13 mounted hinges.

14 With reference to Fig. 4, each countersunk flush mounted hinge  
15 comprises two tenons (41) and a metal pivot (42). Each tenons (41) is made  
16 of resilient material, has an inside end (not numbered), an outside end (not  
17 numbered), an upper edge (not numbered), a lower edge (not numbered), a  
18 recess (not numbered), multiple optional slits (414), multiple optional anti-  
19 slip ribs (416) and multiple optional expansion screws (not numbered). The  
20 tenons (41) are mounted respectively in mortises (412) defined in the front  
21 frame (101), the rear frame (102) and the front or rear boards of the foldable  
22 side panels (11). The slits (414) are defined longitudinally in the tenons (41)  
23 to allow the tenons (41) to compress slightly and easily wedge respectively  
24 into corresponding mortises (412). The anti-slip ribs (416) are formed

transversely on the upper and lower edges of each tenon (41) to provide additional friction between the tenon (41) and the corresponding mortise (412) so the tenon (41) will not slip out of the mortise (412). The expansion screws are aligned respectively with the longitudinal slits (414) and screw into the tenon (41) to spread the tenon (41) and cause the tenon (41) to hold securely in the corresponding mortise (412).

The metal pivot (42) comprises two first sheets (422) and two second sheets (424). Each sheet (422, 424) has two ends (not numbered). The first and the second sheets (422, 424) are pivotally attached to each other at one end and are pivotally attached respectively in the corresponding recesses in the two tenons (41) at the other end. The countersunk flush mounted hinges are mounted between the front frame (101) and the outer edges of the front boards of the foldable side panels (11), between the rear frame (102) and the outer edges of the rear boards of the foldable side panels (11), and between the inner edges of the front and rear boards of the foldable side panels (11) to make the foldable side panels (11) pivot on the foldable frame (10).

The rear panel (12) is attached to the rear frame (102) and has multiple optional ventilating holes (not numbered).

The top panel (20) is attached to the top of the foldable frame (10) and has a bottom surface (not numbered) and multiple head holes (201). The head holes (201) are aligned with the multiple base holes (not numbered) in the top edge of the front and rear boards in each foldable side panel (11).

The bottom panel (22) is attached to the bottom of the foldable frame (10) and has a top face and multiple head holes (221). The head holes (221)

1 are defined in the top face and corresponded to the base holes (not shown)  
2 defined in the bottom edge of the front and rear boards of the foldable side  
3 panel (11). Multiple pop-it fasteners (30) attach the top panel (20) and the  
4 bottom panel (22) to the foldable frame (10).

5 With reference to Fig. 3, each pop-it fastener (30) comprises a  
6 countersunk tube (32), a stud (34) and an optional threaded sleeve (346). The  
7 countersunk tube (32) is made of resilient material and is mounted  
8 respectively inside one corresponding head hole on the top or the bottom  
9 panel (20, 22). The optional threaded sleeve (346) is pressed into one  
10 corresponding base hole to keep the base hole from splitting. The stud (34)  
11 has a threaded rod (342) and a connecting head (344). The threaded rods  
12 (342) of the studs (34) are screwed respectively into base holes or the  
13 threaded sleeves (346) mounted in the base holes corresponding the head  
14 holes. The connecting heads (344) have an outer diameter, a flat end (not  
15 numbered) and an optional screwdriver slot (not numbered) and are pressed  
16 respectively into the countersunk tubes (32) to connect the surface with the  
17 base hole and to the surface with the head hole. The outer diameter of the  
18 connecting head (344) is larger than the countersunk tube (32). Consequently,  
19 the top panel (20) and the bottom panel (22) can be attached to the foldable  
20 frame (10) without using any tools.

21 The door set preferably has two symmetrical retractable door  
22 assemblies (24), a rail assembly (not numbered) corresponding to each door  
23 assembly (24) and at least one locking device (50). The two retractable door  
24 assemblies (24) are mounted inside the foldable frame (10) respectively on

1 two rail assemblies. Each rail assembly is composed of a top rail (26A) and a  
2 bottom rail (26B). The top rail (26A) is attached to the bottom face of the top  
3 panel (20), and the bottom rail (26B) is attached to the top face of the bottom  
4 panel (22), the top and bottom rails (26A, 26B) align with each other. Each  
5 rail (26A, 26B) has a moving block (262). The moving block (262) has  
6 multiple pins (not numbered), is slidably mounted on the rail and detachably  
7 engages a retractable door assembly (24). Each retractable door assembly (24)  
8 has a doorjamb (242) and a door (244) pivotally attached to the doorjamb  
9 (242). The doorjamb (242) has a top edge, a bottom edge and multiple  
10 pinholes (not numbered) to respectively engage the pins on the moving block  
11 (262). Thereby, the retractable door assembly (24) is detachably attached to  
12 the rail assembly (26A, 26B) to slide inside the frame (10). When the  
13 retractable door assembly (24) is pulled out to a limiting position of the rail  
14 assembly, the door (244) can be pivoted inward to cover the front frame (101)  
15 of the frame (10).

16 The at least one locking device (50) is mounted between the door  
17 (244) and the front frame (101) to make the door (244) stay closed against  
18 the front frame (101). With reference to Fig. 5, each locking device (50) has  
19 a plate (52) and a spring-loaded ball (54). The plate (52) has a dent (522) and  
20 is attached to the front frame (101). The spring-loaded ball (54) is partially  
21 embedded in the door (244) and has a housing (not numbered), a ball (542)  
22 and a spring (544). The ball (542) and the spring (544) are mounted inside  
23 the housing and align with the dent (522) in the plate (52). When the door  
24 (244) is closed, the ball (542) is pushed by the spring (544) to engage the

1 dent (522) to hold the door (244) in position relative to the front frame (101).

2 The optional shelf (60) is assembled with the pop-it fasteners (30)  
3 and is mounted inside the foldable frame (10).

4 According to foregoing description, all elements of the DIY cabinet  
5 can be assembled or disassembled without any tools. Moreover, the DIY  
6 cabinet also does not occupy much space when disassembled because each  
7 panel can be detached from the foldable frame (10) and the foldable frame  
8 (10) can be folded to make the size of the cabinet as small as possible.

9 Although the invention has been explained in relation to multiple  
10 preferred embodiments, many other possible modifications and variations  
11 can be made without departing from the spirit and scope of the invention as  
12 hereinafter claimed.